DOCUMENT RESUME

ED 264 294 TM 850 787

AUTHOR Burton, Linda
TITLE The Effects of Musical Accompaniment on Visual Information Processing within and across Selected Personality Type Groups.
PUB DATE Feb 85
NOTE 16p.; Paper presented at the Eastern Educational Research Association (8th, Virginia Beach, VA, February 7-9, 1985). Based on a doctoral dissertation, University of Maryland.
PUB TYPE Dissertations/Theses - Doctoral Dissertations (041) -- Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Analysis of Variance; Cognitive Processes; Higher Education; Individual Differences; *Music Therapy; *Personality Measures; Recognition (Psychology); Visual Learning; *Visual Measures
IDENTIFIERS *Group Embedded Figures Test (Oltman); *Myers Briggs Type Indicator

ABSTRACT

The effects of musical accompaniment on two different visual information processing activities were examined in individuals of differing selected personality types. The Myers Briggs Type Indicator Form G was administered to classes of University students. From the results, four subgroups, the sensing-thinking, sensing-feeling, intuitive-feeling, and the intuitive-thinking were selected with 16 subjects each. Two different visual information processing experiments were conducted. Each experiment contained two parallel portions which were alternately presented with musical accompaniment and without musical accompaniment. Experiment 1 consisted of the two parts of the Group Embedded Figures Test (GEFT) by H. A. Witkin. Experiment 2 consisted of two parallel visual recognition tasks. Results of the two-way analysis of variance in Experiment 1 and Experiment 2 indicated no significant differences between the musical accompaniment treatments or among differing personality types in the number of items correct. However, a significant difference did exist in Experiment 1 in the number of referrals between the musical accompaniment treatments. Significantly less referrals to the figure to be traced in the GEFT were made with musical accompaniment than with no musical accompaniment. There were no significant differences among personality types in the number of referrals. (Author)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED264294

The Effects of Musical Accompaniment on Visual Information Processing Within and Across Selected Personality Type Groups

Linda Burton

Towson State University

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

L Burton

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

TM 850 787

Paper based on doctoral dissertation presented to the Education Policy, Planning and Administration Department, College of Education, University of Maryland.

Abstract

The effects of musical accompaniment on two different visual information processing activities were examined in individuals of differing selected personality types.

The Myers Briggs Type Indicator Form G was administered to classes of University students. From the results, four subgroups, the sensing-thinking, sensing-feeling, intuitive-feeling, and the intuitive-thinking were selected with 16 subjects each.

Two different visual information processing experiments were conducted. Each experiement contained two parallel portions which were alternately presented with musical accompaniment and without musical accompaniment.

Experiment 1 consisted of the two parts of the Group Embedded Figures test by H. A. Widkin. Experiment 2 consisted of two parallel visual recognition tasks.

Results of the two-way ANOVA analysis in Experiment 1 and Experiment 2 indicated no significant differences between the musical accompaniment treatments or among differing personality types in the number of items correct. However, a significant difference did exist in Experiment 1 in the number of referrals between the musical accompaniment treatments. Significantly less referrals to the figure to be traced in the GEFT were made with musical accompaniment than with no musical accompaniment. There were no significant differences among personality types in the number of referrals.

The Effects of Musical Accompaniment on Vistual Information Processing Within and Across Selected Personality Type Groups

Introduction

A number of studies have investigated the effects of music on the learning activities of man. Studies have been conducted investigating the effects of various types of music on numerous different learning activities, but few studies have considered any learner variables other than sex and intelligence. This investigation considered another learner variable. Selected personality typology as defined according to Jung's personality theory, which has also been equated with learning style, was used as a learner variable in this investigation into the effects of music on selected learning activities of man.

The thinking-feeling and sensing-intuitive dimensions of Jungian typology were considered in this investigation. From these two dimensions, four personality types are derived: the sensing-thinking, sensing-feeling, intuitive-feeling and intuitive-thinking (Myers, 1962).

It was believed that sensing-feeling types would perform better on visual information processing tasks when the task was presented with musical accompaniment as opposed to no musical accompaniment. Sensing-feeling types generally do not possess as strong thinking and problem solving abilities as other types. They may, therefore, experience a greater level of frustration when presented with this challenging task. Music of a soothing nature would relax these individuals, lower their level of frustration and allow them to

function more efficiently.

Intuitive-thinking types possess generally stronger mental abilities and should perform well on visual information processing tasks under either condition. Therefore, it was believed that intuitive-thinking types would out perform other types regardless of musical accompaniment.

This investigation examined the effects of musical accompaniment on two visual information processing activities in individuals of differing selected Jungian personality typology.

Summary of Investigation

The effects of musical accompaniment on two visual information processing activities in individuals of differing Jungian personality typology were investigated in two different experiments: Experiment 1, a visual problem solving task, and Experiment 2, a visual recognition task.

Prior to the administration of the two individual experiments, the MBTI was administered to classes of undergraduate students at Towson State University. From these results, subjects were selected whose scores indicated preferences in the thinking-feeling and sensing-intuitive dimensions. Four categories of 16 subjects were selected whose MBTI scores indicated them to be sensing-thinking, sensing-feeling, intuitive-feeling and intuitive-thinking types. Each category consisted of 8 males and 8 females.

Also, prior to conducting the experiments, materials for the visual recognition task in Experiment 2 were pretested and validated using individuals from a similar population as those to be considered

as subjects in the actual experiments. These same individuals participated in music selection.

Individual testing consisted of two parts: Experiment 1, a visual problem solving activity; and Experiment 2, a visual recognition memory task.

Experiment 1 consisted of the Group Embedded Figures Test (Oltman et at., 1971). Prior to the administration of the two parts of the GEFT, the subject completed the practice session included in the test booklet. In this visual problem solving task, the subject was presented with nine items of the embedded figures task. Each item consists of a frame containing a complex drawing. Underneath of each complex drawing the subject is told to find a designated simple drawing which is located on the back of the test booklet. The subject has to refer to the back of the booklet to find the particular drawing, then go back to the complex drawing, find the simple figure and trace over the lines that make up that figure. As specified by the test directions, the subject was given five minutes to complete all of the nine items.

The above procedure was conducted once with musical accompaniment and once without musical accompaniment. In the repeated portion of the test, the problems are different but parallel, though scores may be slightly higher due to practice effect. The two parts of the test were administered in order as specified by the test directions. The music and non-music treatments were alternated as presented in Table 1.

TABLE 1

SUBJECT ASSIGNMENT TO RESPECTIVE SEQUENCE OF TREATMENT

Subject Number					Sequence of Treatments			
1	5	9	13	-	A*	2	3 (music)	B
2	6	10	14	-	B	2	3	A
3	7	11	15	-	A (music)	2	3	B
4	8	12	16	-	B	2	3	A

* A = Set A of presentation and test slides
  B = Set B of presentation and test slides
  2 = Part 2 of GEFT (Part 1 is practice)
  3 = Part 3 of GEFT

Experiment 2, a recognition memory task, consisted of a slide presentation followed by a slide recognition memory task. Two parallel sets of materials, Set A and Set B, were developed. Each set contained a group of 16 presentation slides and a group of 20 test slides. Ten of the 16 presentation slides, together with ten new slides were included in the test set. These materials were developed, tested, and validated by the investigator.

Set A contained eight slides of shells and eight slides of orchids in the presentation portion. Five of each were retained and included in the test portion which contained ten slides of shells and ten slides of orchids. Set B contained eight slides of butterflies and eight slides of mushrooms in the presentation portion. The test portion contained ten slides of butterflies and ten slides of mushrooms. All slides were black and white high contrast drawings.

The 16 presentation slides were projected for 1.75 seconds each. They were projected consecutively with an off time of .75 seconds. A new slide therefore appeared every 2.5 seconds. This projection time was selected for investigators have found that approximately 2.0 seconds are needed for accurate memory of a picture (Spoehr et al., 1982). This investigator desired to have the slide projected long enough for it to be easily perceived, but not so long that careful study or analysis would occur.

Following the presentation slides, the test slides were presented. Each of the 20 test slides was presented for 5.0 seconds during which time the subject was to make a decision and indicate

whether the slide had been previously presented or not, and to indicate the degree of certainty of his answer.

The above procedure was conducted twice; once with Set A and once with Set B. Musical accompaniment was present in one of the sets with the presentation slides. There was no musical accompaniment presented with the test slides. The inclusion of musical accompaniment in the test set was not considered desirable since it may have added uncontrollable effects like confusion in cues.

The order of the music and non-music presentation was alternated so that half in each group received the music treatment first and half received the non-music treatment first. The two parallel sets were also alternated so half of the subjects saw Set A first and half saw Set B first.

The administration of the two sets, Set A and Set B, were separated by the administration of Experiment 1. This separation was employed in order to minimize interference from one set to the other. The order of the administration of the experimental components is presented in Table 1.

The type of musical accompaniment used in the experiments was light instrumental contemporary music. The selection used in Experiment 1 to accompany the embedded figures task was a portion from the selection "Wes" from the album Two of a Kind by Earl Klugh and Bob James(1982). The selection used to accompany the slides in Experiment 2 was a portion of the selection "A Thousand Teardrops" from the album Shadowfax(1982). These choices were made based on discussions with individuals knowledgeable in the music field and

reactions from similar populations to those used in the investigation.

Data collected in Experiment 1 were the number of correct items on each part of the GEFT and the number of referrals to the figure to be traced on the back of the text booklet.

Data collected in Experiment 2 were the number of items correctly identified and the degree of confidence indicated by the subject for each decision in the visual recognition task on each part.

Summary of Findings

After the results were analyzed, it was found in Experiment 1 that sensing-feeling types did perform slightly better in the problem-solving task when presented with musical accompaniment as opposed to no musical accompaniment (means of 6.19 and 6.44 respectively). However, as indicated in Table 2, these differences were not significant. Conversely, intuitive-thinking types performed at a lower level with musical accompaniment as opposed to with no musical accompaniment (means of 5.75 and 6.06 respectively). Again, these means were not significantly different. No significant difference existed between treatment levels of personality type or between the repeated measure of music on the number of correct items on the GEFT in Experiment 1.

The analysis of the number of referrals to the original figure to be traced in Experiment 1 indicated that less referrals were made by each of the four MBTI types when the task was presented with

TABLE 2

DESCRIPTIVE STATISTICS AND SUMMARY OF THE ANALYSIS OF VARIANCE ON EMBEDDED FIGURES TASK (N=64)

MBTI	No Music Mean	No Music S.D.	With Music Mean	With Music S.D.
Sensing-Thinking	5.38	2.96	5.44	2.61
Sensing-Feeling	6.19	2.29	6.44	2.42
Intuitive-Feeling	5.44	2.39	5.13	2.73
Intuitive-Thinking	6.06	3.19	5.75	2.65

SUMMARY OF ANOVA

SOURCE	SS	DF	MS	F
MBTI (Treatment)	21.648	3	7.216	0.603
Subj. W. Groups	718.281	60	11.971	
Music (rep. measure)	0.195	1	0.195	0.085
Interaction	1.898	3	0.632	0.276
Error - W.	137.406	60	2.290	
TOTAL	879.428	127		

** $p<0.01$ * $p<0.05$

musical accompaniment as opposed to with no musical accompaniment (Table 3). This difference was significant to the p .01 level. Only slight differences existed on the number of referrals among the differing personality types, and none of these differences were significant.

In Experiment 2, the visual recognition task, only slight differences were observed in the group means. Although the differences were not significant, overall the sensing-feeling type performed better with no musical accompaniment than with musical accompaniment. As indicated in Table 4 no significant difference existed between the treatments or among the groups.

Confidence levels were indicated in Experiment 2 for each response on the recognition task. Two different total confidence scores were derived for both parts of the test. Confidence score C_1 was computed considering only the correct items on the test. These items were given a positive value of 1, 2, or 3 according to the confidence level indicated by the subject. C_1 was derived by totaling the positive scores for each correct item.

In C_2, incorrect items were given a negative value of -1, -2, or -3, were totaled and added with the positive confidence score.

A chi square analysis was computed for both C_1 and C_2. No significant difference was found in either confidence score for the two treatments.

TABLE 3

DESCRIPTIVE STATISTICS AND SUMMARY OF THE ANALYSIS OF VARIANCE OF THE NUMBER OF REFERRALS ON EMBEDDED FIGURES TASK (N=64)

MBTI	No Music		With Music	
	Mean	S.D.	Mean	S.D.
Sensing-Thinking	21.69	8.76	18.19	8.76
Sensing-Feeling	19.38	7.94	17.	6.
Intuitive-Feeling	22.	8.40	19.06	6.41
Intuitive-Thinking	17.56	7.48	16.13	8.23

SUMMARY OF ANOVA

SOURCE	SS	DF	MS	F
MBTI (Treatment)	271.063	3	90.354	1.061
Subj. W. Groups	5109.938	60	85.166	
Music (rep. measure)	210.125	1	210.125	8.260**
Interaction	18.563	3	6.188	0.243
Error - W.	1526.313	60	25.439	
TOTAL	7136.002	127		

** $p<0.01$ *$p<0.05$

TABLE 4

DESCRIPTIVE STATISTICS AND SUMMARY OF THE ANALYSIS OF VARIANCE ON VISUAL RECOGNITION TASK (N=64)

MBTI	No Music		With Music	
	Mean	S.D.	Mean	S.D.
Sensing-Thinking	16.31	1.50	16.81	1.91
Sensing-Feeling	16.31	1.45	15.38	2.09
Intuitive-Feeling	15.75	2.29	15.94	2.14
Intuitive-Thinking	16.44	2.03	16.63	1.62

SUMMARY OF ANOVA

SOURCE	SS	DF	MS	F
MBTI (Treatment)	15.836	3	5.279	1.153
Subj. W. Groups	274.781	60	4.580	
Music (rep. measure)	7.812	1	7.813	0.0028
Interaction	9.586	3	3.195	1.155
Error - W.	165.906	60	2.765	
TOTAL	466.177	127		

** $p<0.01$ *$p<0.05$

Conclusions

Based on the findings in this study, the following conclusions can be drawn.

1. Individual performance levels on visual information processing activities are not affected by the presence or absence of musical accompaniment when presented with the visual information processing activities.

2. Individuals who display preferences in the differing Jungian personality dimensions of sensing-thinking, sensing-feeling, intuitive-thinking and intuitive-feeling display no differences in performance levels on visual information processing activities.

3. Individual behavior in completing visual information processing activities may be altered by the presence of musical accompaniment in some of these activities, even though there are no differences in performance levels.

4. Individual confidence levels concerning performance on visual information processing activities are no different with musical accompaniment as compared with no musical accompaniment.

Although the learner variable of Jungian personality typology was found to be an insignificant factor in the task examined here, learner variable is an area which needs further exploration in studies of this type.

References

Klugh, Earl and Bob James. Wes. Two of a Kind. Album: Tapan Zee Records/Columbia Records, 1982. SMAS-1244.

Myers, I. B. Manual, the Myers - Briggs Type Indicator. Palo Alto, CA: Consulting Psychologists Press, 1962, 1977.

Oltman, P. K., Raskin, E., & Witkin, S. A. The Group Embedded Figures Test. Palo Alto, CA: Consulting Psychologist Press, 1971.

Shadowfax. A Thousand Teardrops. Shadowfax. Album: Windham Hill Records, 1982. WHSC-1022B.

Spoehr, K. T. and Lehmkuhle, S. W. Visual Information Processing. San Francisco: W. H. Freeman and Company, 1982.